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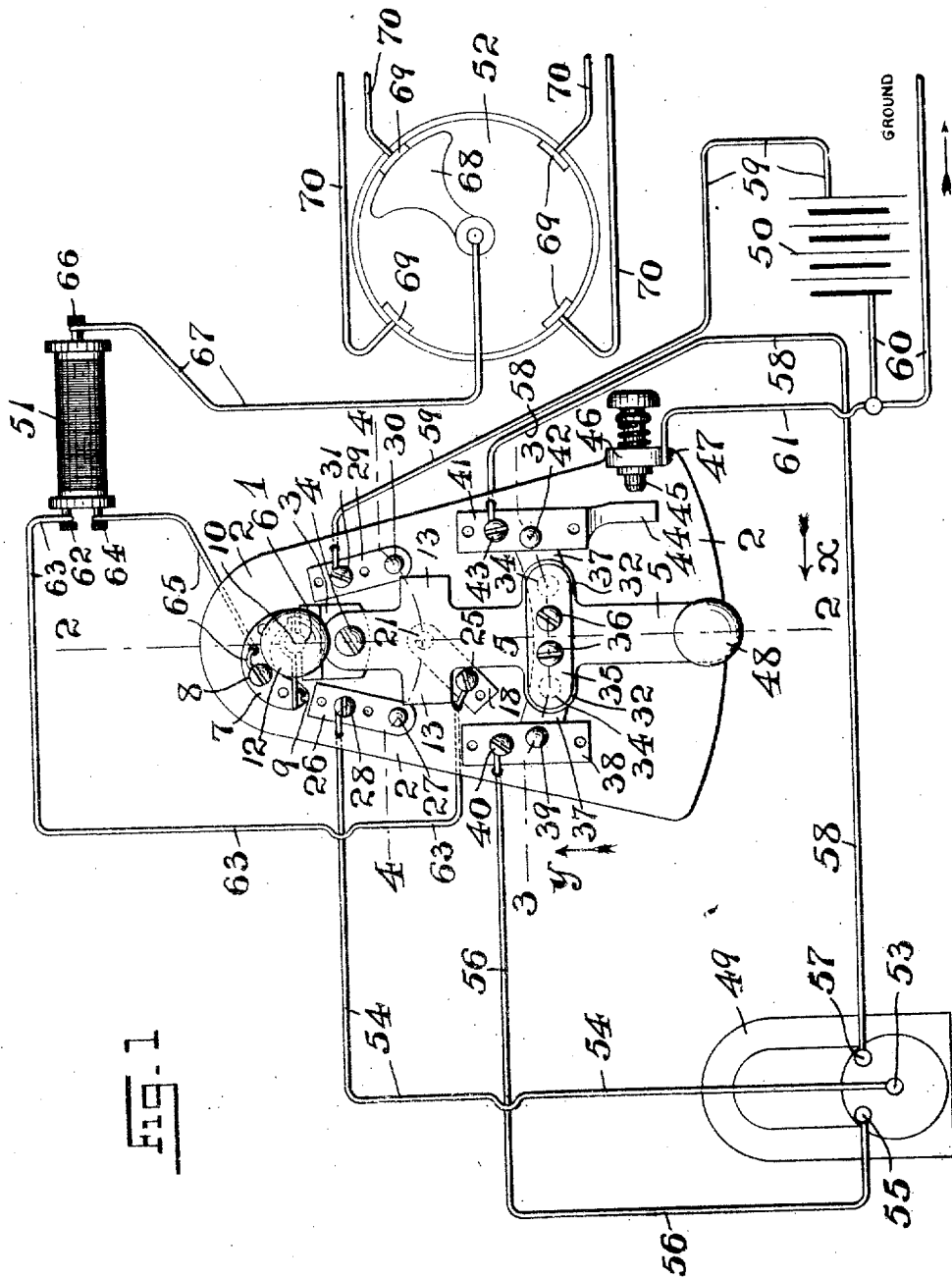


FIG. 1

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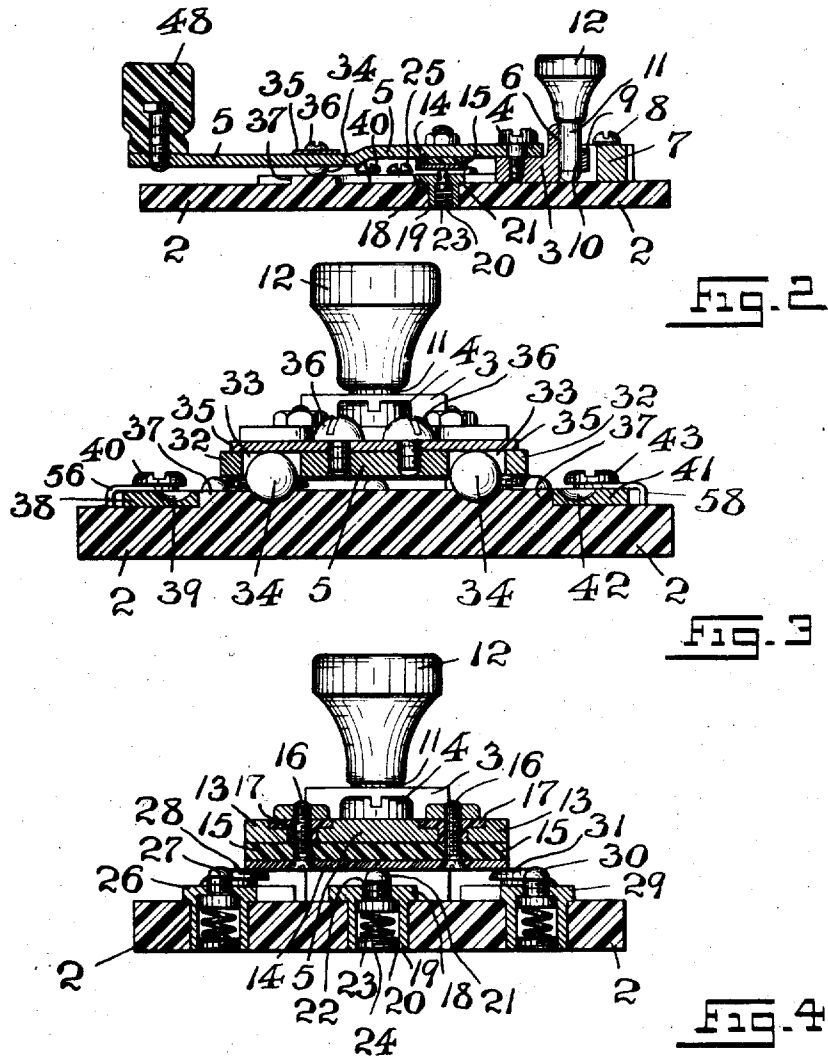
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ELECTRICAL CIRCUIT SWITCH.
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1,018,381.

Patented Feb. 20, 1912.

2 SHEETS—SHEET 2.



WITNESSES:

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ELECTRICAL-CIRCUIT SWITCH.

1,018,381.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Original application filed May 25, 1910, Serial No. 563,237. Divided and this application filed January 16, 1911. Serial No. 602,791.

To all whom it may concern:

Be it known that I, JAMES M. SMITH, citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electrical-Circuit Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

This invention has reference, generally, to improvements in electrical circuit switches; and, the present invention is a division of the subject-matter of my former application for Letters-Patent, filed May 25, 1910, Serial Number 563,237.

The principal object of my present invention is to provide a novel switching device adapted to control the flow of either of two independent electrical circuits into a common field of work, such for example, as the control of two generating circuits of an ignition system, so as to pass either one or the other through a single induction-coil and distributing device, as shown in the drawings accompanying this application which illustrates one manner of using the present invention, although it is not my intention to limit my novel switching device merely to such illustrative use.

Other objects of the present invention not at this time more particularly enumerated, will be clearly understood from the following detailed description of the same.

With the various objects of the present invention in view, the said invention consists, primarily, in the novel switching device hereinafter set forth; and, the said invention consists, furthermore, in the novel arrangements and combinations of the various devices and parts, all of which will be more fully described in the following specification, and then finally embodied in the clauses of the claim which are appended to and which form an essential part of the said specification.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a plan or face view of the novel switching device made according to and embodying the principles of the present invention, the same being shown in connection with the diagrammatic representation of an ignition system, said view illustrating more particularly the operation of the switching device and one of the uses to which the same may be applied. Fig. 2 is a longitudinal vertical section of the switching device, said section being taken on line 2—2 in said Fig. 1; looking in the direction of the arrow *x*; Fig. 3 is a cross-section of said switching device, taken on line 3—3 in said Fig. 1, looking in the direction of the arrow *y*, the same being drawn on an enlarged scale; and Fig. 4 is another cross-section of the same, taken on line 4—4 in said Fig. 1, looking in the direction of the arrow *y*, this view being also drawn upon an enlarged scale.

Similar characters of reference are employed in all of the hereinabove described views, to indicate corresponding parts.

Referring now to the said drawings, the reference-character 1 indicates a novel switching device, made according to and embodying the principles of the present invention. Said switching device comprises a base or body-member 2 of any desirable shape or configuration, the same being preferably constructed of some insulating material. Secured upon said base or body-member 2 is a fulcrum-block 3, the same being adapted to receive a screw 4, or similar means, designed to serve as a fulcrum for a switch-arm 5, which is made of metal or other material which is a good conductor of electricity. The rear end of said fulcrum-block 3 is provided with a semi-circular groove 6.

Secured, by any suitable means, upon the base or body-member 2 is a contact-block 7, provided with a screw 8, or other means, adapted to provide a binding post. Connected with said contact-block 7 is a spring-arm 9, the free end of which is bent, so as to form a vertical semicircular groove 10, adapted to register in its position opposite the said groove 6 in said fulcrum block 3. The said registering grooves 6 and 10, as will be evident, provide a suitable receiving socket for the shank 11 of a contact

bridging plug 12, which, when the same is pushed into its normal operative position, tends to electrically connect the said contact block 7, the fulcrum-block 3, and the switch-arm 5 connected with the latter. Said switch-arm 5 is provided with a pair of oppositely extending lugs 13, said lugs extending outwardly from each side of the said switch-arm. Secured to said switch-arm 5, so as to register beneath said lugs 13, is a contact-plate 14, the same being insulated from electrical contact with said switch-arm by means of an intervening insulator-plate 15. The said contact-plate 14 is held in place by means of bolts and nuts 16, which are also insulated from electrical contact with said switch-arm 5 by means of the insulator-sleeves 17. Secured upon said base or body-member 2, by any suitable means, is a contact-carrier 18, which is provided with a tubular portion 19 adapted to be countersunk in the said base or body-member 2, and arranged in said tubular portion 19 is the head 20 of a yieldable contact-point 21, which projects upwardly through a suitable hole or perforation 22 in said contact-carrier so that the same will bear against said contact plate 14. Said contact point 21 is maintained in its contacting relation by means of a coil-spring 23 which is arranged beneath the head 20 and within said tubular portion 19, the said spring being retained in place by means of a screw-threaded plug 24 secured within the lower end of said tubular portion 19. Said contact-carrier 18 is further provided with a screw 25, or other means, adapted to provide a binding-post. A contact-carrier 26 of similar construction as that herein-above described is arranged upon and connected with the said base or body-member to one side of said switch-arm 5. This said contact-carrier is also provided with a spring-actuated contact-point 27, and a screw 28, or other means, adapted to provide a binding post. In like manner, another contact-carrier 29 is arranged upon and connected with the base or body-member 2, and is located adjacent to the other side of said switch-arm 5, the said contact-carrier 29 being also provided with a spring-actuated contact point 30, and a screw 31, or other means, adapted to provide a binding-post. The switch-arm 5 is further provided with another pair of oppositely extending lugs or arms 22 which are formed with suitable holes or perforations 33 in which are seated ball-contacts 34, the latter being retained in their operative relation by means of a spring-plate 35 secured by means of screws 36, or any other retaining means, to said switch-arm 5. The free ends of said spring-plate 35 extend outwardly over each perforation or hole 33, and bear against said ball-contacts 34. The said base or body-member 2 is further provided with a rib or

upwardly projecting portion 37 upon which said ball-contacts 34 ride, and secured upon said base or body-member 2, in any suitable manner, but adjacent to one end of said rib or projecting portion 37, is a contact-plate 38 which is provided with a receiving-seat 39 for one of said ball-contacts 34, when the latter is registered with or brought above said contact-plate 38 by the movement of said switch-arm 5. Said contact-plate 38 is provided with a screw 40, or other means, providing a suitable binding-post. In like manner, there is arranged and secured upon said base or body-member 2, in any suitable manner, adjacent to the other end of said rib or projecting portion 37 another contact-plate 41, also provided with a receiving seat 42 for the reception of the other of said ball-contacts 34, when the same is registered with or brought above said contact-plate 41, by the opposite movement of said switch-arm 5. Said contact-plate 41 is also provided with a screw 43, or other means, adapted to provide a binding-post. The said contact-plate 41 is further provided with a contact-point 44, arranged to receive the contact of a spring-actuated contact-pin 45, mounted in a supporting-block 46 secured by any suitable means to said base or body-member 2. Said supporting-block 46 is also provided with a screw 47, or other means, adapted to provide a binding post. The said switch-arm 5 is provided at its free end with a handle-portion or member 48, which forms a suitable manipulating means therefor, said handle-portion or member being constructed of some insulating material to render the same safe against electrical shocks when handled, the said member 48 being screwed or otherwise secured to the free end of said switch-arm 5.

To illustrate the operation and use of my novel switching device, the detailed construction of which has been hereinabove set forth, I have shown in connection with Fig. 1 of the accompanying drawings, an electrical system which is adapted to be controlled by said switching-device. It will be understood, however, that I do not wish to confine the use of my switching device to the use herein shown and described, since that use is merely illustrative, and various applications of my switching device to other uses, and in other electrical systems, can be made, as will be clearly evident.

The electrical system I have chosen to illustrate the use of my switching device is a high-tension ignition system, in which two generating circuits are employed, one of said circuits being supplied by a magneto-generator 49, and current being supplied to the other circuit by a battery 50. Through my switching device either of said generating circuits may be connected in circuit with a main line or circuit in which is placed an

induction-coil 51, and the current-distributor 52 of the ignition system. Connected with the magneto-generator 49, so as to be operated by the revolution of the armature shaft, are mechanical circuit interrupters or make and break devices of any well-known type, there being an interrupter for both the magneto circuit and the battery circuit, said mechanical interrupters being inclosed in a suitable casing. The said mechanical interrupter for the magneto circuit is provided with a terminal 55, which may be termed the magneto interrupter terminal; in like manner the mechanical interrupter for the battery circuit is provided with a terminal 57, which may be termed the battery interrupter terminal. The completion of the respective magneto and battery circuits through their interrupters or make and break devices will be understood from the subsequent description of the operation of the novel switch.

The wiring of the two generating circuits, as connected with my novel switching device, briefly, is as follows:—Connected with an armature-terminal 53 of said magneto-generator 49 is a wire-conductor 54, which extends to the contact-carrier 26, and is secured thereto by the screw 28. Connected with the magneto interrupter-terminal 55 is a wire conductor 56 which extends to the contact-plate 38, and is secured thereto by the screw 40. Connected with the battery interrupter-terminal 57 is a wire-conductor 58, which extends to the contact-plate 41, and is secured thereto by means of the screw 43. Connected with one pole of the battery 50 is a wire-conductor 59, which extends to the contact carrier 29, and is secured thereto by means of the screw 31. The other pole of said battery 50 is connected by means of a wire-conductor 60 to a ground. This wire-conductor 60 has an extension 61 which is connected with the supporting block 46 of said contact-pin 45, by means of a screw 47. The terminal 62 of the primary winding of said induction-coil 51 is connected with a wire-conductor 63, which extends to said carrier-plate 18, and is secured thereto by means of said screw 25. The other terminal 64 of the primary winding of said induction-coil 51 is connected with a wire-conductor 65, which extends to said contact-block 7, and is secured thereto by means of screw 8. The terminal 66 of the secondary winding of said induction-coil 51 is connected with a wire-conductor 67, which extends to and is connected with the revolving distributor-arm or contact 68 of said distributing device 52, by means of which a high-tension current is distributed through terminals 69 and connecting wires 70 to the ignition-terminals. The primary winding of the said induction-coil may be connected in either of said gener-

ator-circuits by the action of my switching device.

Assuming that the magneto-circuit be desired, the same is completed as follows:—The wire-conductor 54 conducts the current to the contact-carrier 26 and its contact-point 27 of the switching device. Assuming that the switch-arm 17 is shifted to the left so as to bring its contacting portions in contact, respectively, with the said contact-carrier 26 and its contact-point 27, and with said contact-plate 38 and its contact receiving-seat 39, the current then flows from said contact-point 27 into the contact-plate 14, carried by said switch-arm 5, which bridges the same to the contact-point 21 of the contact-carrier 18, whereupon the current is conducted thence along the wire-conductor 63 to the terminal 62 of the induction-coil 51, returning from the terminal 64 thereof through the wire-conductor 65 to the contact-block 7, and thence into the switch-arm 5 and ball-contact 34 to the contact-plate 38, and thus back to the magneto, by way of the wire-conductor 56 to the magneto-interrupter-terminal 55, to the magneto ground.

Assuming that the battery circuit be desired to be connected with said induction-coil, the same is completed as follows:—The wire-conductor 59 conducts the current from one pole of the battery 50 to the contact-carrier 29 and its contact-point 30 of the switch device. Assuming that the switch-arm 5 is shifted to the right so as to bring its contacting portions in contact, respectively, with the said contact-point 30, and with the contact-plate 41 and its contact-receiving seat 42, the battery current flows from the said contact-carrier 29 and its contact-point 30 into the contact-plate 14 carried by said switch-arm 5, which bridges the same to the contact-carrier 18 and its contact-point 21, whereupon the current is conducted thence along the wire-conductor 63 to the terminal 62 of the induction-coil, returning from the terminal 64 thereof through the wire-conductor 65 to the contact-block 7, thence into the switch-arm 5 and ball-contact 34 to the contact-plate 41, thence to the battery-interrupter or make and break terminal 57, by way of the wire-conductor 58, and back to the battery 50 by way of the ground.

The auxiliary spring-actuated contact-pin 45 affords a means for quickly closing the battery circuit direct, (as in the present use for example,) without rendering it necessary to complete the circuit through the ground.

I am aware that changes may be made in the various arrangements and combinations of the devices and parts, as well as in the details of the construction of said parts, without departing from the scope of my

present invention as set forth in the foregoing specification, and as defined in the claims which are appended to the said specification. Hence, I do not limit my invention to the exact arrangements and combinations of the various devices and parts as described in the said specification; nor do I confine myself to the details of the construction of the said parts as disclosed in the accompanying drawings.

I claim:—

1. A switch-device for switching into a main line alternate generator or other circuits, comprising a base-member, a switch-arm pivotally mounted upon said base-member, an insulated contact-plate carried by said switch-arm, a contact-member mounted on said base-member, said contact member being in constant contact with said insulated contact-plate carried by said switch-arm, a pair of contact-members mounted on said base-member, either one or the other being adapted to be engaged by said insulated contact-plate on said switch-arm when said switch-arm is properly moved, another pair of contact-members mounted on said base-plate either one or the other of which is adapted to contact with said switch-arm when the same is properly moved, substantially as and for the purposes set forth.

2. In a switch of the character set forth, the combination with a base-member of a movable switch-arm provided with spring actuated contact-points and an insulated contact-plate, a contact-carrier mounted on said base-member carrying a spring-actuated contact-point which is constantly in contact with said insulated contact-plate carried by said switch-arm, a contact-block mounted on said base-member, means for electrically connecting said contact-block with said movable switch-arm, and contact members mounted on said base-member adapted to be engaged upon proper movement of said switch arm respectively by said spring actuated contact-points of said switch-arm and said contact-plate carried by said switch-arm, substantially as and for the purposes set forth.

3. In a switch of the character set forth the combination with a base-member of a movable switch-arm provided with spring actuated contact-points and an insulated contact-plate, a contact-carrier mounted on said base-member carrying a spring-actuated contact-point which is constantly in contact with said insulated contact-plate carried by said switch-arm, a contact-block mounted on said base-member, means for electrically connecting said contact-block with said movable switch-arm, contact plates mounted on said base-member adapted to be engaged by said spring-actuated contact-points upon said switch-arm, contact-carriers mounted on said base-member,

said contact-carriers being provided with spring-actuated contact-points adapted to be engaged by said insulated contact-plate carried by said switch-arm, substantially as and for the purposes set forth.

4. In a switch of the character set forth, the combination with a base-member of a movable switch arm provided with contact-points and an insulated contact-plate, a contact-member mounted on said base-member which is constantly in contact with said insulated contact-plate carried by said switch-arm, and contact-members mounted on said base-member adapted to be engaged upon proper movement of said switch-arm respectively by said contact-points of said switch-arm and said contact-plate carried by said switch-arm, substantially as and for the purposes set forth.

5. In a switch of the character set forth, the combination with a base-member of a movable switch-arm provided with contact-points and an insulated contact-plate, a contact-member mounted on said base-member which is constantly in contact with said insulated contact-plate carried by said switch-arm, contact-members mounted on said base-member adapted to be engaged upon proper movement of said switch-arm respectively by said contact-points of said switch-arm and said contact-plate carried by said switch-arm, a contact-block mounted on said base-member, and means for electrically connecting said contact-block with said movable switch-arm.

6. In a switch of the character set forth the combination with the switch-body and its contact points of a movable switch-arm pivotally supported upon said switch-body, a pair of outwardly and oppositely extending arms connected with said switch-arm, a contact-plate supported by said oppositely extending arms, means for insulating said contact-plate from said oppositely extending arms and said switch-arm proper, a second pair of outwardly and oppositely extending arms connected with said switch-arm proper, the free ends of said second pair of oppositely extending arms being provided with spring actuated contact means, substantially as and for the purposes set forth.

7. In a switch of the character set forth the combination with the switch-body and its contact points of a movable switch-arm pivotally supported upon said switch-body, a pair of outwardly and oppositely extending arms connected with said switch-arm, a contact-plate supported by said oppositely extending arms, means for insulating said contact-plate from said oppositely extending arms and said switch-arm proper, a second pair of outwardly and oppositely extending arms connected with said switch-arm proper, the free ends of said second

pair of oppositely extending arms being provided with spring-actuated contact means, a contact block mounted on said switch-body, and means for electrically connecting said contact-block with said movable switch-arm, substantially as and for the purposes set forth.

In testimony, that I claim the invention

set forth above I have hereunto set my hand this 12th day of January, 1911.

JAMES M. SMITH.

Witnesses:

JOS. H. YERKES,

RICHARD P. POWELL,

WILSON D. CRAIG WRIGHT.